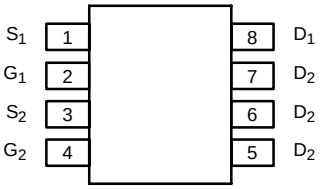
Asymetrical Dual N-Channel 30-V (D-S) MOSFET

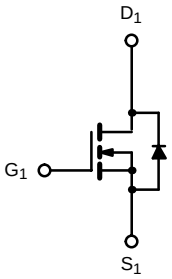
PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
Channel-1	30	0.022 @ V_{GS} = 10 V	6.3
		0.030 @ V_{GS} = 4.5 V	5.4
Channel-2		0.0105 @ V_{GS} = 10 V	11.5
		0.0145 @ V_{GS} = 4.5 V	10

SO-8

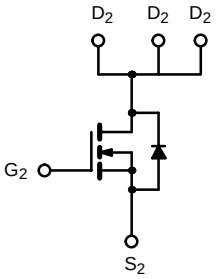


Top View

Ordering Information: Si4924DY
Si4924DY-T1 (with Tape and Reel)



N-Channel 1
MOSFET



N-Channel 2
MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)							
			Channel-1		Channel-2		
Parameter		Symbol	10 secs	Steady State	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	30				V
Gate-Source Voltage		V_{GS}	± 20				
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	6.3	5.3	11.5	8.6	A
	T_A = 70°C		5.4	4.2	9.5	6.9	
Pulsed Drain Current		I_{DM}	30		40		
Continuous Source Current (Diode Conduction)[a]		I_S	1.3	0.9	2.2	1.15	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.4	1.0	2.4	1.25	W
	T_A = 70°C		0.9	0.64	1.5	0.80	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150				°C

THERMAL RESISTANCE RATINGS							
			Channel-1		Channel-2		
Parameter		Symbol	Typ	Max	Typ	Max	Unit
Maximum Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	72	90	43	53	°C/W
	Steady-State		100	125	82	100	
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJC}	51	63	25	30	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

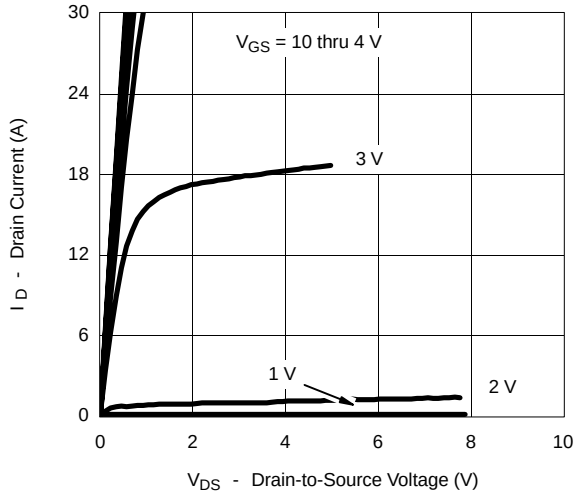
MOSFET SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition		Min	Typ[a]	Max	Unit
Static							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	Ch-1	0.8			V
			Ch-2	0.8			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V	Ch-1			±100	nA
			Ch-2			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V	Ch-1			1	μA
			Ch-2			1	
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 85°C	Ch-1			15	
			Ch-2			15	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	Ch-1	20			A
			Ch-2	30			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 6.3 A	Ch-1		0.018	0.022	Ω
		V_{GS} = 10 V, I_D = 11.5 A	Ch-2		0.0088	0.0105	
		V_{GS} = 4.5 V, I_D = 5.4 A	Ch-1		0.024	0.030	
		V_{GS} = 4.5 V, I_D = 10 A	Ch-2		0.0115	0.0145	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 6.3 A	Ch-1		17		S
		V_{DS} = 15 V, I_D = 11.5 A	Ch-2		30		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.3 A, V_{GS} = 0 V	Ch-1		0.7	1.1	V
		I_S = 2.2 A, V_{GS} = 0 V	Ch-2		0.72	1.1	
Dynamic[a]							
Total Gate Charge	Q_g	Channel-1 V_{DS} = 15 V, V_{GS} = 5 V, I_D = 6.3 A Channel-2 V_{DS} = 15 V, V_{GS} = 5 V, I_D = -11.5 A	Ch-1		8.0	12	nC
			Ch-2		25.5	35	
Gate-Source Charge	Q_{gs}		Ch-1		1.75		
			Ch-2		4.5		
Gate-Drain Charge	Q_{gd}		Ch-1		3.2		
			Ch-2		11.5		
Gate Resistance	R_g		Ch-1	1.5		6.1	Ω
			Ch-2	0.5		2.4	
Turn-On Delay Time	$t_{d(on)}$	Channel-1 V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω Channel-2 V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω	Ch-1		10	20	ns
			Ch-2		15	30	
Rise Time	t_r		Ch-1		5	10	
			Ch-2		11	20	
Turn-Off Delay Time	$t_{d(off)}$		Ch-1		26	50	
			Ch-2		58	100	
Fall Time	t_f		Ch-1		8	16	
			Ch-2		53	100	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.3 A, di/dt = 100 A/μs	Ch-1		30	60	
		I_F = 2.2 A, di/dt = 100 μA/μs	Ch-2		42	70	

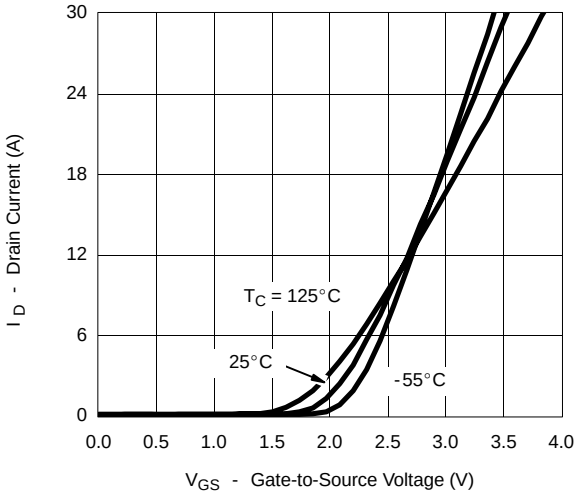
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-1

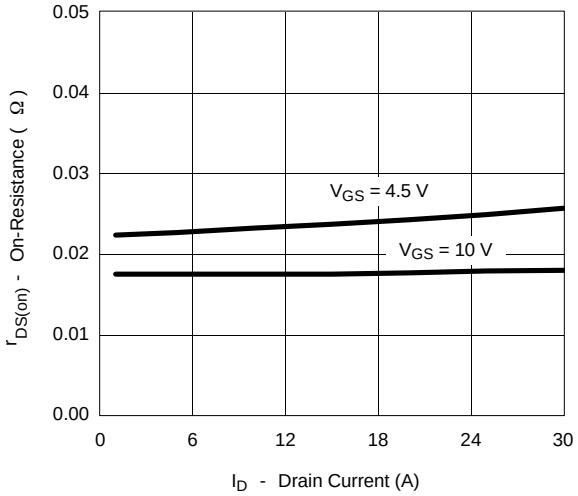
Output Characteristics



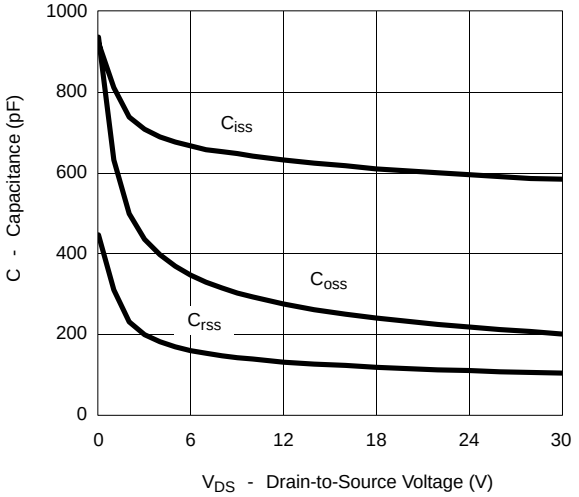
Transfer Characteristics



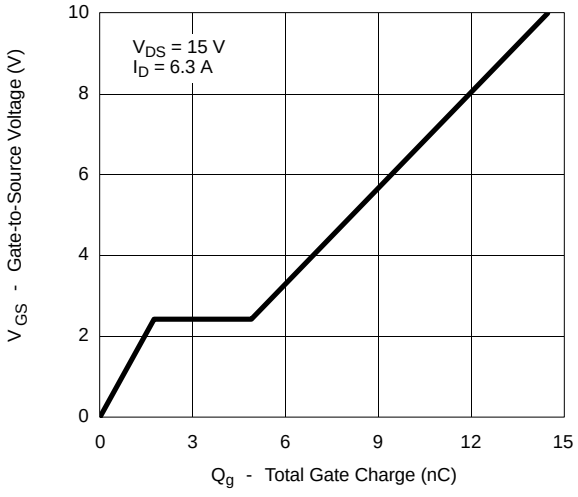
On-Resistance vs. Drain Current



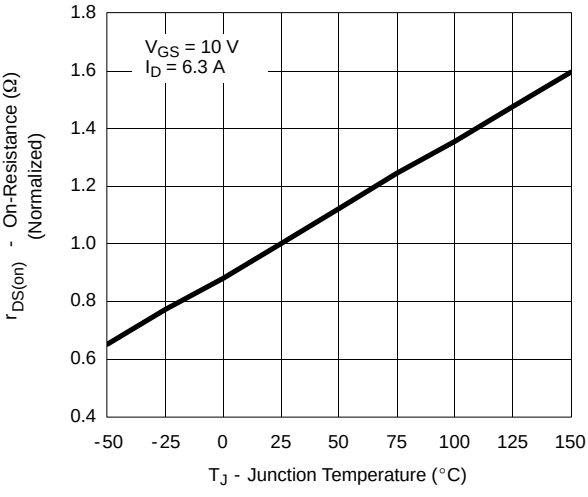
Capacitance



Gate Charge

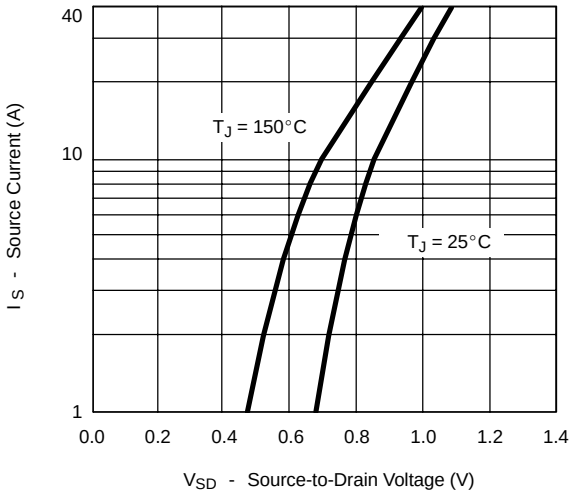


On-Resistance vs. Junction Temperature

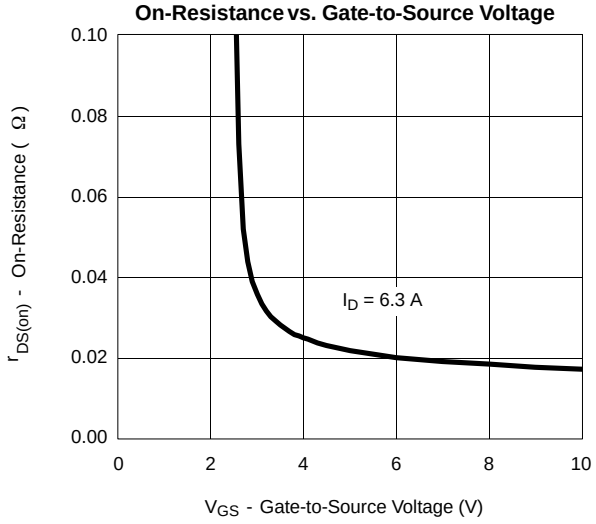


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-1

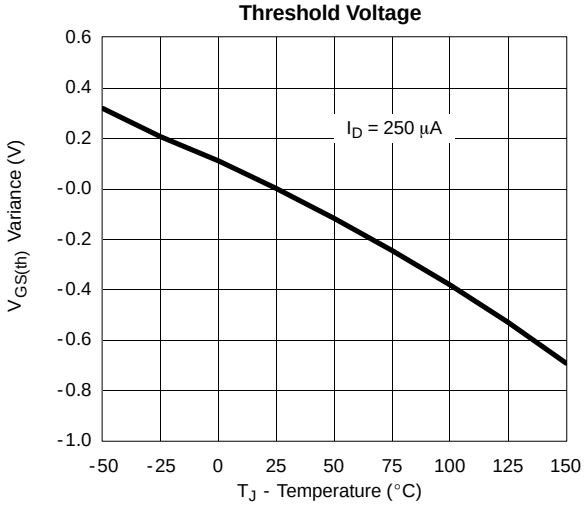
Source-Drain Diode Forward Voltage



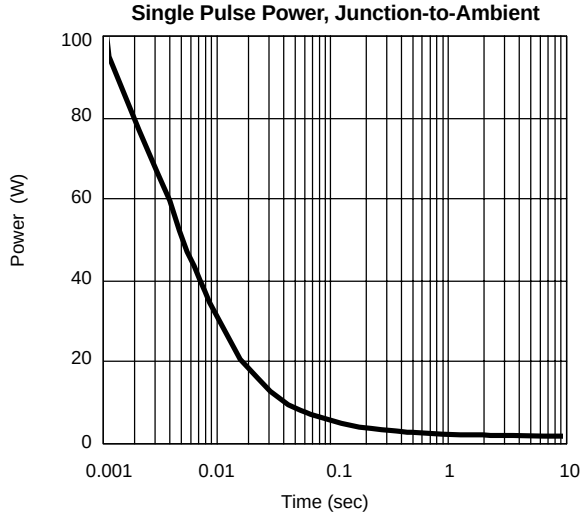
On-Resistance vs. Gate-to-Source Voltage



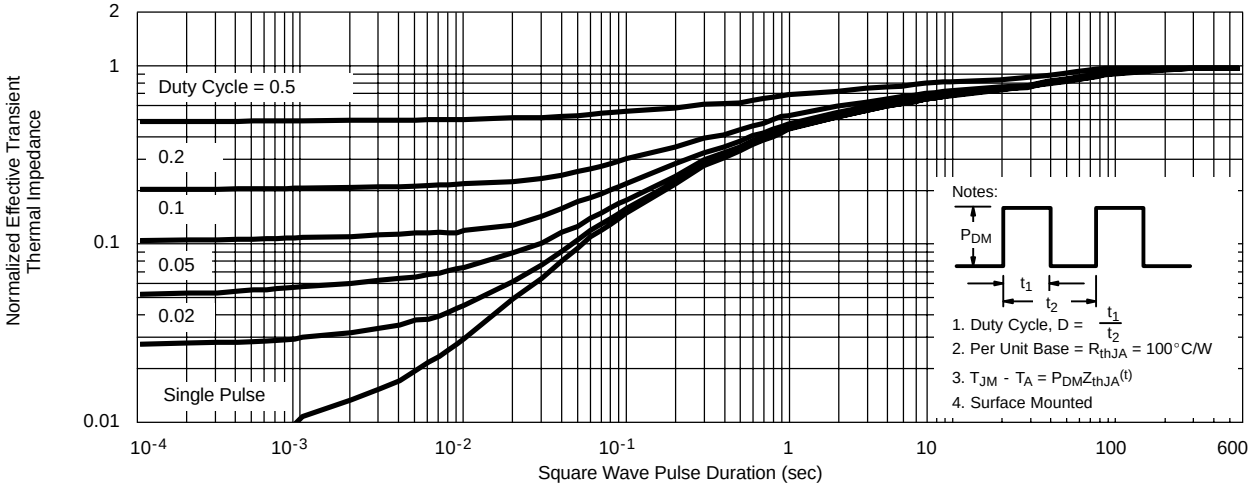
Threshold Voltage



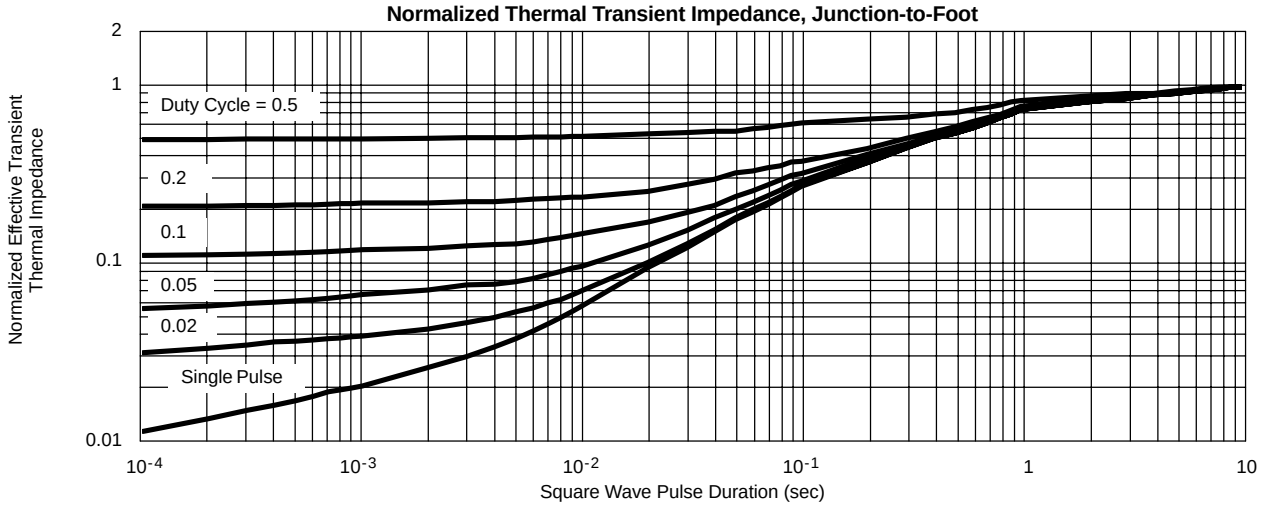
Single Pulse Power, Junction-to-Ambient



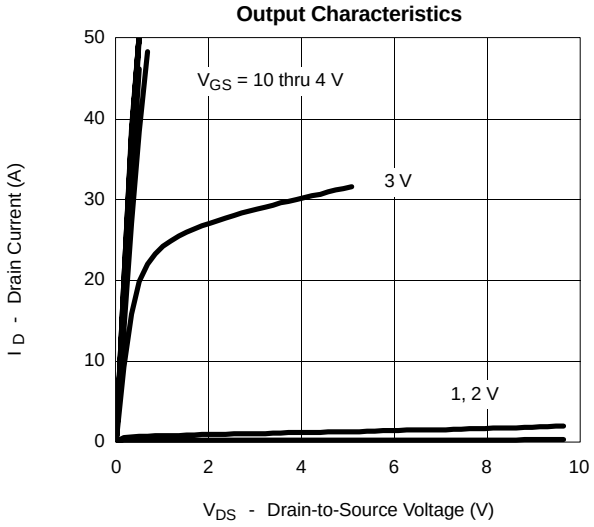
Normalized Thermal Transient Impedance, Junction-to-Ambient

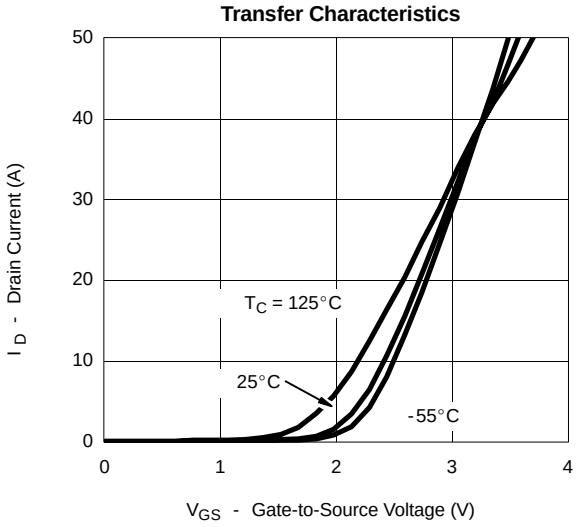


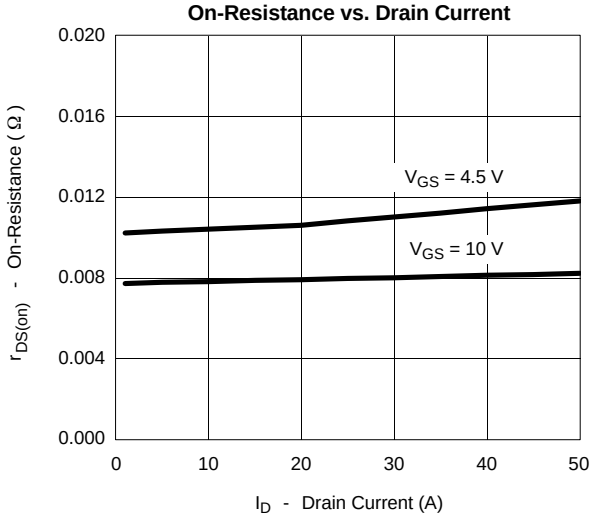
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-1

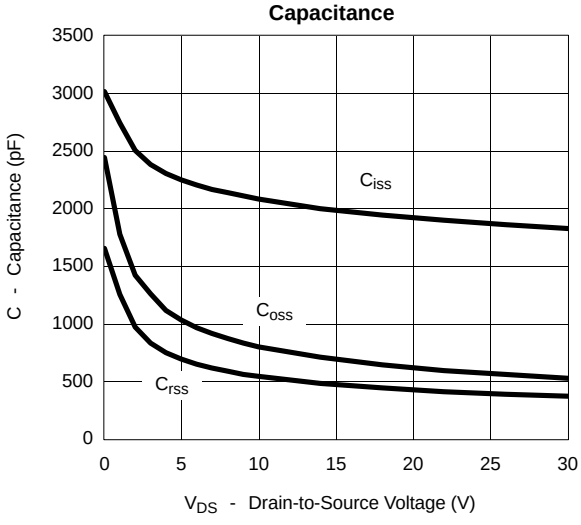


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2



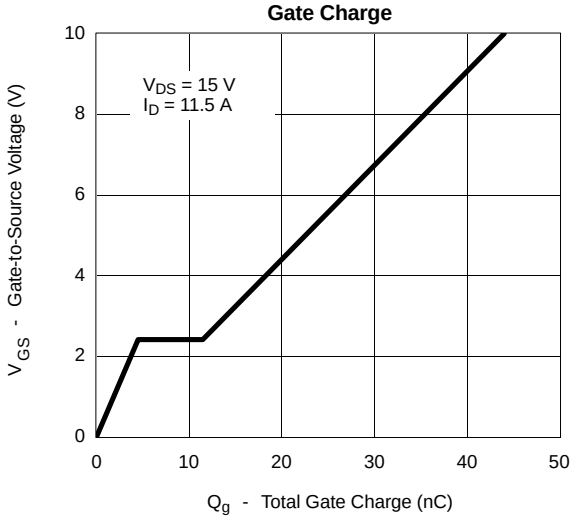




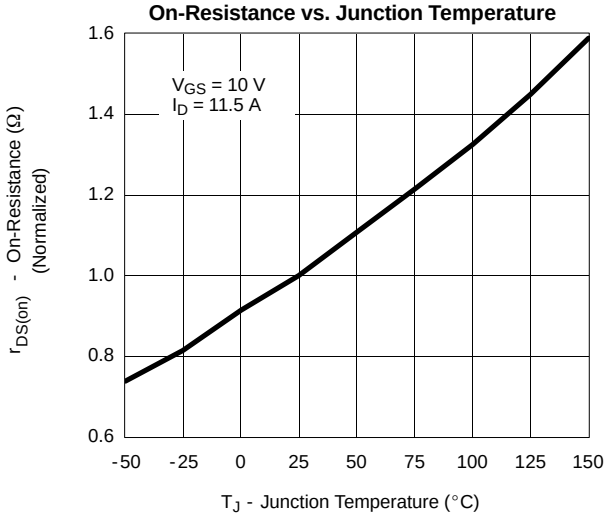


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2

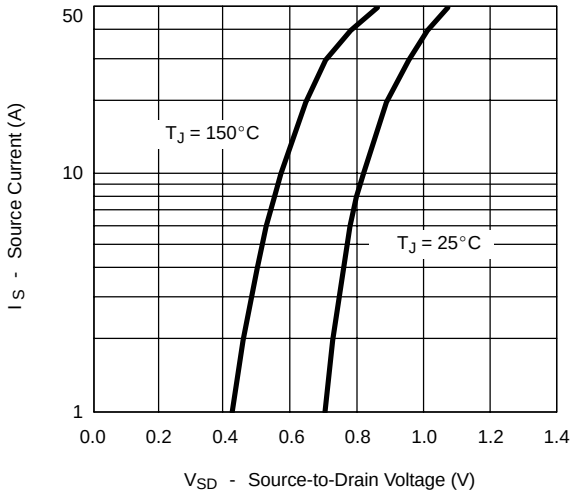
Gate Charge



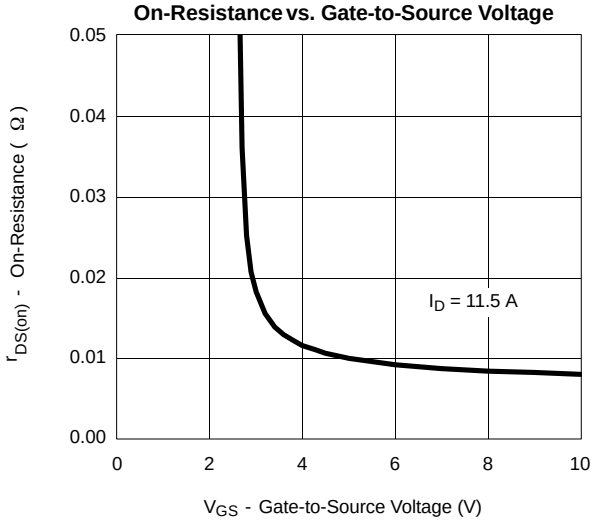
On-Resistance vs. Junction Temperature



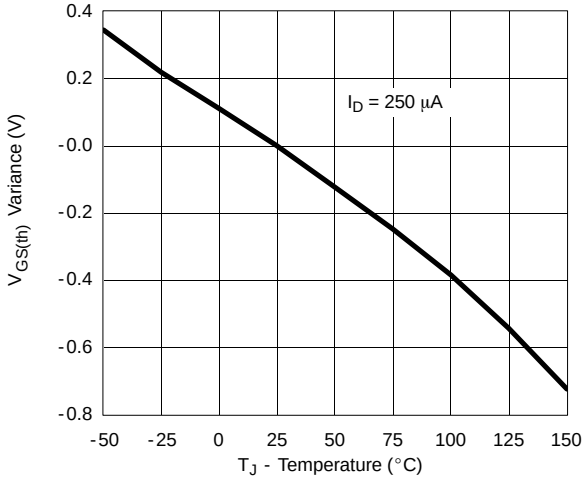
Source-Drain Diode Forward Voltage



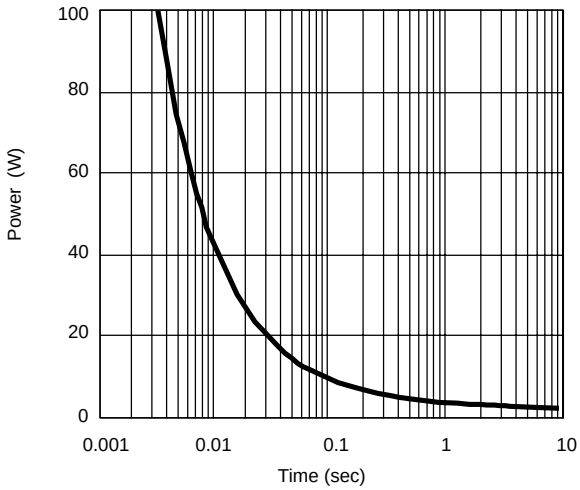
On-Resistance vs. Gate-to-Source Voltage



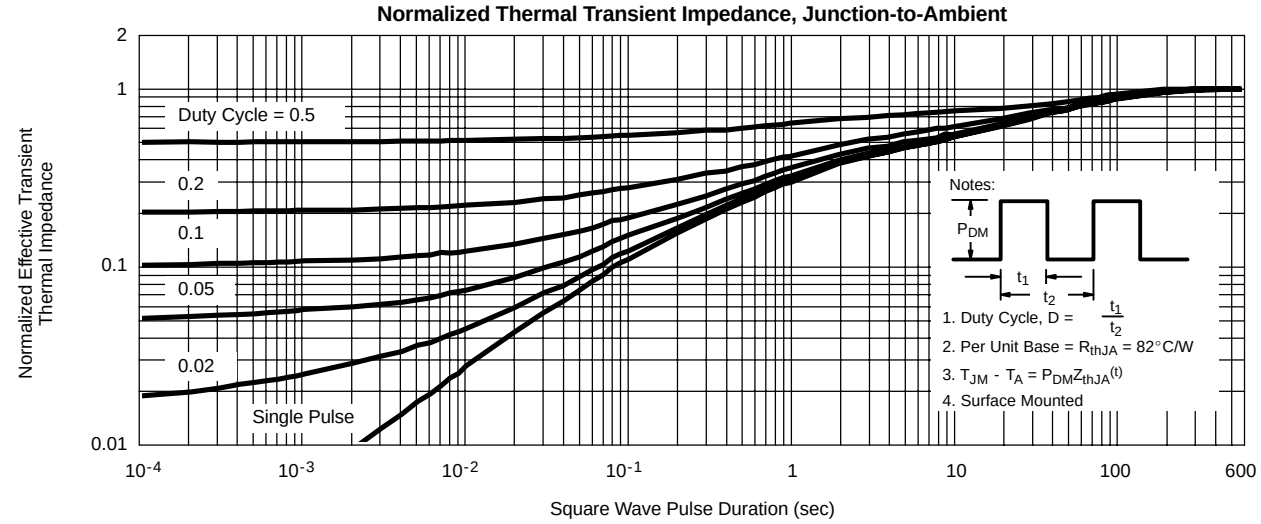
Threshold Voltage

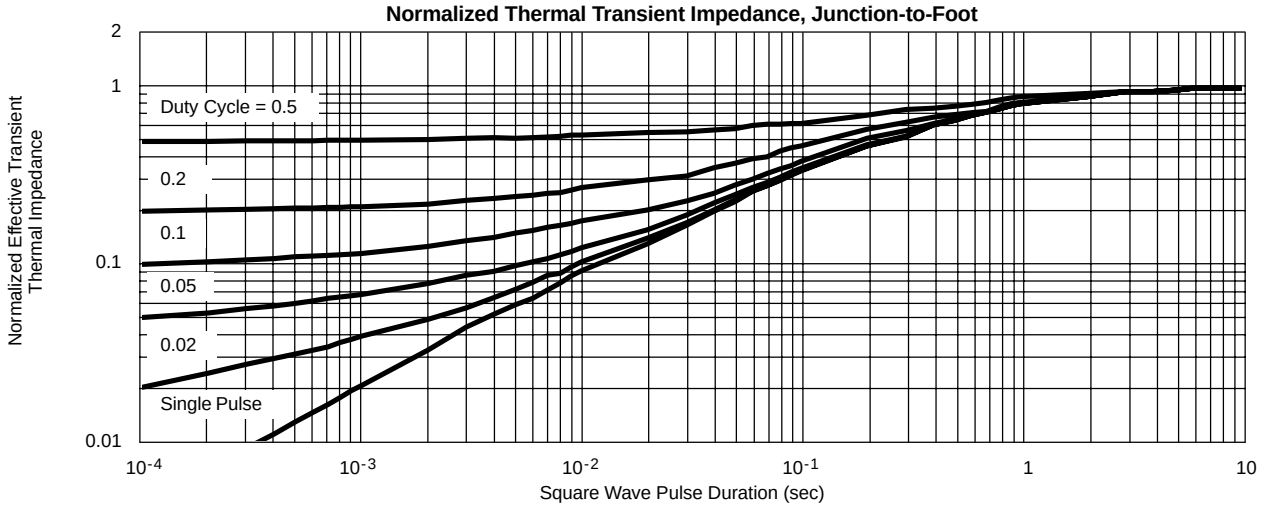


Single Pulse Power, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2





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